

APPLICATION FOR
UNITED STATES LETTERS PATENT
SPECIFICATION

TO WHOM IT MAY CONCERN:

Be it known that I, Mr. Lou Porto, a citizen of the United States of America, and resident of the State of California, having a postal address of P.O. Box 354, Walnut, California 91788, have invented a new and useful “**Automated Water Disabling Valve For An Appliance**”, of which the following forms the specification.

AUTOMATED WATER DISABLING VALVE FOR AN APPLIANCE

CROSS REFERENCE TO RELATED APPLICATIONS

According to 35 U.S.C. Section 119(e), this application is entitled to the benefit of provisional application no. 60/466,899 filed on May 1, 2003.

BACKGROUND OF THE INVENTION

1. Technical Field of the Invention

The present invention relates to an automated valve for an appliance that disables water flow thereto in the event of appliance or water supply line failure.

2. Description of the Prior Art

Many appliances such as water heaters, dishwashers, washing machines, ice makers and toilets are connected to a water supply line. The appliance also typically includes a level sensor, timer switch or other control device that toggles a supply valve to intermittently deliver fresh water when needed. Inevitably, the appliance, or water supply line therefor, will fail resulting in continuous, unrestrained water flow until a user discovers the problem and disables a primary supply valve. As a result, the failure can result in significant water damage to a dwelling. Accordingly, there is currently a need for a device that automatically disables the water supply to an appliance in the event of an aforementioned malfunction.

The present invention satisfies the above described need by providing an automated control valve that is installed on a water supply line upstream from an appliance. The valve includes means for detecting appliance or supply line failure and for automatically disabling water flow in response thereto.

SUMMARY OF THE INVENTION

The present invention relates to a water flow disabling valve for an appliance including a substantially hollow shell having an inlet and an outlet. Preferably, the inlet includes a female pipe thread connector while the outlet includes a male pipe thread connector for easily coupling the device with a water supply pipe. A water conduit within the shell extends from the inlet to the outlet. The water conduit includes a solenoid operable valve for selectively disabling flow therethrough. The solenoid operated valve is electrically connected to a microprocessor that instructs the valve to open and close.

A sensing channel is in fluid communication with the water conduit for detecting the pressure differential between the inlet and outlet. Received within the sensing channel is a spring-biased, plastic-coated magnet that selectively seats within a throat to disable flow through the channel. A Hall effect device is positioned exteriorly of the sensing channel at a position adjacent the throat.

When a given appliance requests feed water, pressure on the outlet side of

the sensing channel decreases rapidly thereby moving the magnet toward the Hall effect device and into the throat to disable flow through the sensing channel.

Simultaneously, the magnet actuates the Hall effect device, which signals the microprocessor to open the solenoid valve and start a timer. When the

5 downstream appliance water control means disables water flow, pressure on the outlet end of the sensing channel will begin increasing until equalized with that of the inlet end. Accordingly, the spring-biased magnet will gradually migrate to its original position whereby the Hall effect device transmits an instructional signal to the microprocessor that the appliance is operating normally. If the downstream
10 water supply line or appliance fails, the magnet remains seated within the throat; accordingly, the microprocessor would not receive the requisite signal whereby the timer closes the solenoid valve after a predetermined duration.

It is therefore an object of the present invention to provide a water flow disabling device that minimizes water damage caused by a malfunctioning
15 appliance or broken water supply line.

It is another object of the present invention to provide a device that automatically disables water flow to an appliance in the event of appliance or water supply line failure.

It is yet another object of the present invention to provide a water flow

disabling device that is inexpensive to manufacture and operate.

Other objects, features, and advantages of the present invention will become readily apparent from the following detailed description of the preferred embodiment when considered with the attached drawings and the appended
5 claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a top, cross-sectional view of the device.

Figure 2 is a side, cross-sectional view of the device.

Figure 3 is an end view of the device.

10 Figure 4 is a block diagram of the various electrical components according to the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention relates to a water flow disabling valve for an appliance including a substantially hollow shell **1** having an inlet **2** and an outlet **3**.

15 Preferably, the inlet includes a female pipe thread connector **4** while the outlet includes a male pipe thread connector **5** for easily coupling the device with a water supply pipe. An inlet water conduit **7** extends from the inlet to an outlet fluid conduit **8** that terminates at the outlet. The inlet and outlet fluid conduits intersect at a valve seat **10** that establishes fluid communication therebetween.

A solenoid operable valve **12** includes a retractable pin **31** with a plunger **32** at a distal end. The plunger is movable into and out of the seat for selectively disabling flow through the conduits. The solenoid operated valve is electrically connected to a microprocessor **13** having an integral timer **33** that instructs the valve to open and close. The timer duration can be selected with a binary DIP switch **20** on the exterior surface of the shell.

A sensing channel **14** is in fluid communication with both the inlet and outlet fluid conduits for detecting the pressure differential therebetween. Received within the sensing channel is a spring-biased, plastic coated magnet **15** that selectively seats within a throat **16** to disable flow through the channel. A Hall effect device **17** is positioned exteriorly of the sensing channel at a position adjacent the throat.

When a given appliance requests feed water, pressure on the outlet end of the throat decreases rapidly thereby moving the magnet toward the HALL effect device. The magnet then is positioned within the throat to disable flow through the sensing channel. Simultaneously, the Hall effect device signals the microprocessor to open the solenoid valve and start a timer. When the downstream appliance water control means (i.e. timer, level control valve, etc.) disables water flow, pressure on the outlet end of the sensing channel will begin

increasing until equalized with that of the inlet end. Accordingly, the spring-biased magnet will gradually migrate to its original position thereby transmitting an instructional signal to the microprocessor that the appliance is operating normally; the microprocessor then closes the solenoid valve. If the downstream
5 water supply line or appliance fails, the magnet remains within the throat; accordingly, the microprocessor does not receive the requisite signal whereby the timer closes the solenoid valve after a predetermined duration.

The above described device is preferably operated with batteries 22; furthermore, if the batteries become depleted, the microprocessor automatically
10 closes the solenoid valve until the batteries are replaced.

The above described device is not limited to the exact details of construction and enumeration of parts set forth above. Furthermore, the size, shape and details of construction can be varied as desired.

Although there has been shown and described the preferred embodiment of
15 the present invention, it will be readily apparent to those skilled in the art that modifications may be made thereto which do not exceed the scope of the appended claims. Therefore, the scope of the invention is only to be limited by the following claims.